



Tuchman Cleaners
Site # *1991 02 503*
Remediation Planning

June 12, 2007

Attention: Dawn Groves, Project Manager
Indiana Department of Environmental Management
100 N. Senate Ave.
Mail Code 6630 IGCN 1101
Indianapolis, IN 46204-2251

Re: Bioremediation Pilot Test
Tuchman Cleaners
4401 N. Keystone Avenue
Indianapolis, IN

RECEIVED

JUN 15 2007

DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY

Dear Ms. Groves:

This letter has been prepared to indicate NDCI and URS' plan to implement a pilot-scale bioremediation program at the Tuchman Cleaners facility (site) located on Keystone Avenue in Indianapolis, Indiana. A brief summary of events that led to this plan is presented below.

BACKGROUND

In June 2003, after detecting relatively high concentrations of tetrachloroethene (PCE) in groundwater samples collected from recovery well RW-3, URS installed an automated DNAPL recovery system. Between November 2005 and January 2006, the DNAPL recovery system removed approximately 2,000 pounds of DNAPL from the subsurface of the site. In May 2006, after the DNAPL recovery rate decreased to less than 0.01 pounds per day, URS performed a pump test to evaluate the presence/absence of additional recoverable DNAPL. Results of the pump test indicated relatively high detections of PCE (33 mg/L) in groundwater, however no DNAPL was detected. Based on the pump test results, URS recommended that a treatment test (by air stripping) be conducted on the combined influent from recovery wells RW-1 and RW-3. URS asserted that, if the test results were favorable, the existing groundwater treatment system might be enhanced by extracting and treating groundwater from both RW-1 and RW-3.

In November 2006, URS conducted a 30-minute groundwater pumping and treatment test to evaluate the extent to which groundwater extracted from RW-3 might be treated by the existing air stripping system. During the test, groundwater extracted from RW-3 at 2 gallons per minute was combined with groundwater extracted from RW-1 at 8 gallons per minute, for a total combined flow rate of 10 gallons per minute. A sample of the influent from RW-3 and a sample of the treated effluent were collected and submitted to Pace Analytical Services, Inc. of Indianapolis, Indiana for EPA Method 8260 Volatile Organic Compounds (VOCs).

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The analytical results from the November 2006 pumping and treatment test were unexpected; the concentration of PCE detected in RW-3 was 200 mg/L, approximately 5 times higher than the analytical results for samples collected from RW-3 in May 2006. Additionally, the combined effluent analytical result indicated that the existing air stripping system is not currently capable of reducing the concentration of VOCs (from RW-3) sufficiently to meet the City of Indianapolis permit limit of 1.0 mg/L VOCs.

In summary, the November 2006 pumping and treatment test results indicate that groundwater pumping from RW-3 will not be permissible until a) an air stripping system is installed with a higher air to water ratio, or b) the concentration of PCE in groundwater extracted from RW-3 is reduced by other means.

INSITU REDUCTION OF PCE

DNAPL-range detections of PCE in RW-3 are a priority because DNAPL represents the more significant, longer-term environmental impairment at this site. Accordingly, URS and NDCI plan additional testing and treatment in the RW-3 area. Based on the detection of PCE-daughter products, i.e., TCE, cis-1,2-DCE, and VC in several site monitoring wells, it is evident that natural attenuation (biodegradation) of chlorinated VOCs is occurring in the shallow saturated zone of the site, including the general area occupied by RW-3. Therefore, URS and NDCI plan to conduct a pilot bioremediation study in the vicinity of RW-3 to evaluate the extent to which natural attenuation may be enhanced.

To support the pilot bioremediation study, groundwater samples were recently collected from monitoring wells MW-1, MW-4, MW-11, and piezometer IB-7, and submitted to Microbial Insights, Inc. of Rockford, Tennessee for targeted polymerase chain reaction (PCR) analysis, specifically the census of *D. ethenogenes* bacteria recognized for their ability to degrade PCE and its daughter products to ethene. The PCR results were favorable, particularly at monitoring well MW-4 (2.66×10^6 cells per mL). While these results are promising and indicate that natural attenuation is occurring at the site, URS and NDCI recognize that such attenuation is limited by the lack of naturally occurring electron donor compounds. Therefore, URS and NDCI will conduct a bioremediation pilot study consisting of the following elements:

- Installation of five injection points approximately 8 to 10 feet upgradient of RW-3. The injection points were installed on May 23 and May 24, 2007 in the locations shown on

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Attachment 1 (locations I-1 through I-5 to approx. 23 feet below ground surface, just above the till aquitard).

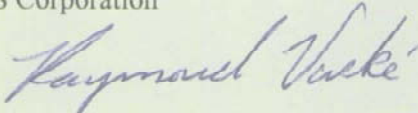
- Injection of 50 pounds of microscale zero valent iron (ZVI)
- Injection of 210 gallons of a mixture of edible oil, sodium lactate, yeast extract, and vitamin B12
- Injection of 600 gallons of groundwater extracted from monitoring well MW-4.

Because it is rich in naturally occurring DHC bacteria required to degrade PCE and its daughter products to ethene, groundwater from MW-4 is being used as the carrier solution for the remediation compounds to be injected. The volume of groundwater and remediation compounds will be divided evenly between the five aforementioned injection locations. The injection program is tentatively scheduled for June 20, 2007. Monitoring will be conducted quarterly thereafter at select monitoring well locations to evaluate the effect of the injection program.

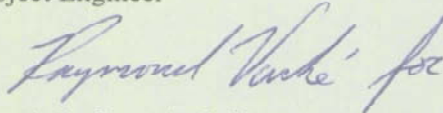
Please contact the undersigned as soon as possible with questions or comments. IDEM's efforts in facilitating this study, i.e., written or verbal communication regarding the use of site groundwater for source area remediation, are appreciated.

Sincerely,

URS Corporation



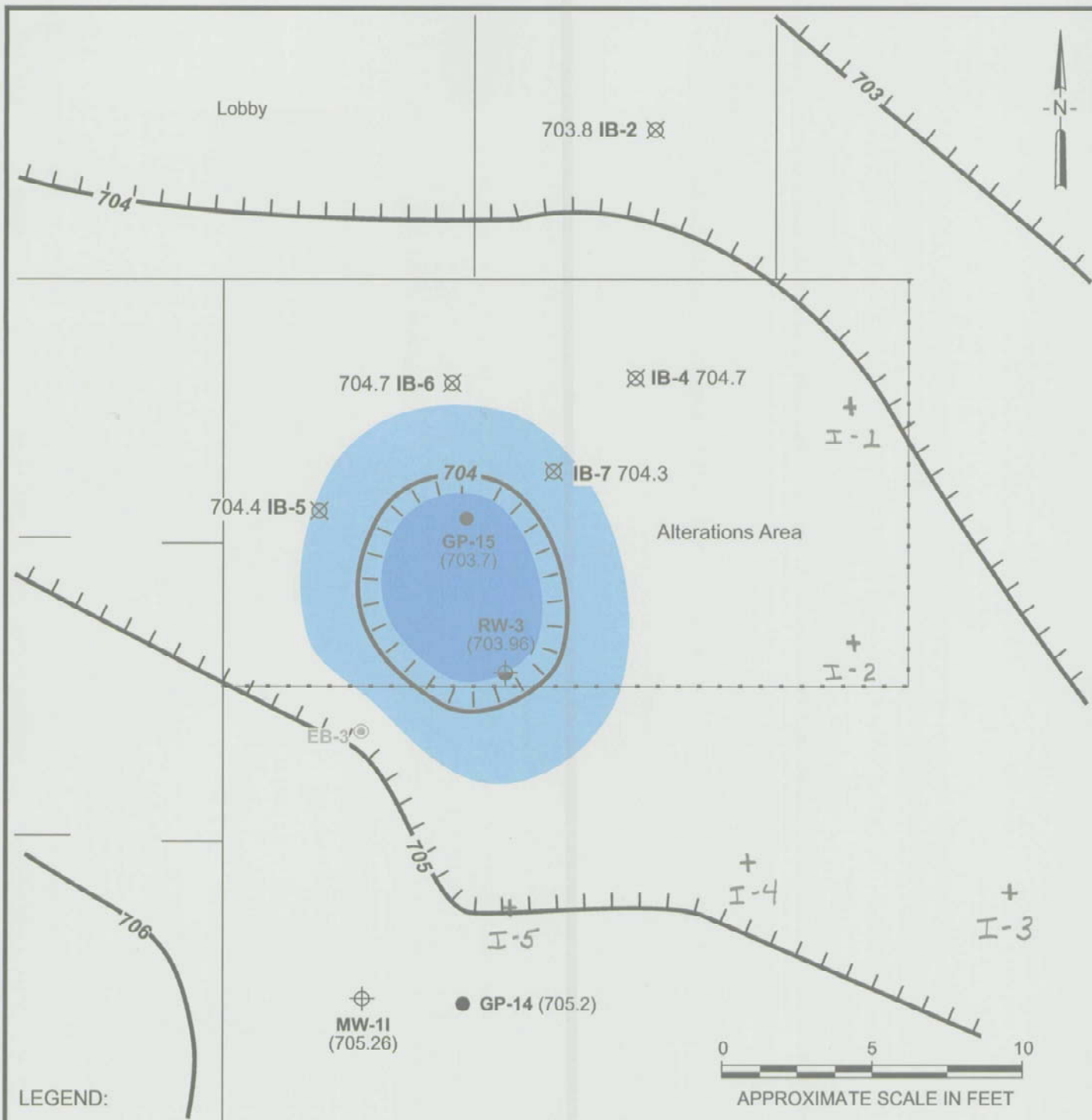
Raymond Vaské
Project Engineer



Dennis P. Connair, P.G.
Principal

ATTACHMENT 1

INJECTION LOCATION MAP



TUCHMAN CLEANERS
 4401 NORTH KEYSTONE AVENUE
 INDIANAPOLIS, INDIANA

FIGURE 13
PROJECTED DNAPL EXTENT

Job No. 14944888

URS